Survey Report

Understanding the Place of Sunscreens in Dermatology Practice

Version No.: 1.1

The study was conducted according to the approved protocol and in compliance with the protocol, Good Clinical Practice (GCP), and other applicable local regulatory requirements.

Table of content

1 INTRODUCTION

The skin serves as the primary barrier between the body and the environment, constantly exposed to various oxidative stressors such as solar radiation, environmental pollutants (e.g., combustion engine emissions, cigarette smoke, halogenated hydrocarbons, heavy metals, and ozone). This makes the skin the frontline defence against external environmental threats [1]. Approximately 80 to 90% of skin cancers are caused by exposure to ultraviolet radiation. [2]. The incidence of skin cancer has increased significantly in the past four decades that it has become one of the most common cancers globally, accounting for 33% of cancer cases worldwide [3].

Excessive exposure to ultraviolet (UV) radiation from the sun can lead to both acute and chronic skin damage. These harmful effects can be mitigated through sun-protective behaviors such as limiting sun exposure during peak hours, seeking shade, applying sunscreen, avoiding tanning beds, and wearing protective clothing [4]. Among the strategies to reduce the adverse effects of the sun, the use of a broad-spectrum sunscreen is recommended to protect against ultraviolet A (UVA) and ultraviolet B (UVB) radiation [5].

Both the Canadian Dermatology Association (CDA) and the American Academy of Dermatology (AAD) recommend the use of sunscreen for the prevention of skin cancer [6,7]. Sunscreen usage plays a pivotal role in dermatology practice, serving as a cornerstone in the prevention and management of various skin conditions related to sun exposure. The combined use of sunscreen, seeking shaded areas, and wearing protective clothing, hats, and sunglasses is highly effective in preventing photodamage and photodermatoses triggered by UV radiation [8,9].

Moreover, the AAD advises applying at least SPF-30 sunscreen 15 minutes before sun exposure as a daily routine [6]. The CDA recommends that children older than 6 months and adults use broad-spectrum sunscreens with an SPF of 30 or higher [7]. Split-face studies have shown that SPF 100 sunscreens provide better protection against sunburns than SPF 50 in real-world conditions. However, SPF 30 is typically recommended due to the tendency for sunscreen under-application, which can compromise its effectiveness. A higher SPF helps

to compensate for potential gaps in application and enhances overall sun protection efficacy[10].It is also recommended to apply the sunscreen to cover the entire body and reapply every two hours[11].

Sunscreens contain chemical (organic) or physical (inorganic) compounds that block ultraviolet radiation, including UVA1, UVA2, UVB, and ultraviolet c with wavelengths shorter than visible light. Chemical filters like oxybenzone, avobenzone, and octocrylene absorb high-intensity UV radiation, converting it into lower-energy wavelengths like infrared radiation upon returning to their ground states [2].

In dermatological practice, dermatologists prescribed sunscreen based on individual skin types, informed by understanding sunscreen formulations, SPF, and UVA protection ratings. However, dermatologists are actively exploring strategies to enhance sunscreen adherence and effectiveness despite challenges in diverse populations.

This study employs a questionnaire-based survey conducted among physicians across India to explore the critical role of sunscreens in dermatology practice by evaluating their effectiveness in preventing sun-induced skin damage, and promoting the integration of effective sunscreen strategies into daily skincare routines to enhance overall skin health.

2 RATIONALE OF THE STUDY

The rationale for this study was to explore the pivotal role of sunscreens in dermatology, focusing on their effectiveness in preventing UV-induced skin damage and reducing the risk of skin cancers and premature aging. Understanding their efficacy, safety, and optimal use is crucial for promoting skin health and reducing the burden of UV-related skin conditions.

3 STUDY OBJECTIVE

The primary objective of the study was to examine current practices in dermatological sunscreen usage, evaluating efficacy, safety, and adherence

across diverse populations, and exploring advancements in sunscreen formulations and applications.

4 METHODS

This study employed a cross-sectional, questionnaire-based design to evaluate current practices, efficacy, safety, and adherence to sunscreen usage in dermatology among Indian physicians, and to explore advancements in sunscreen formulations and applications.

The target population comprised physicians practicing dermatology in India. Participants were recruited through professional networks and medical associations known to engage in dermatological practice. Physicians were identified and invited to participate via email or professional network announcements. Prior to participation, detailed information regarding the study's objectives, procedures, and confidentiality measures was provided to potential participants.

A structured questionnaire consisting of 15 questions was developed to gather data on physicians' clinical experience, sunscreen prescribing practices, safety and adherence observations, and perceptions of emerging trends in sunscreen formulations. The questionnaire was administered electronically to facilitate efficient data collection and ensure uniformity in responses.

Responses to the survey were collected electronically using a secure platform to maintain participant anonymity and data confidentiality. Completed surveys were stored securely in compliance with applicable data protection regulations. Statistical analysis was conducted to summarize survey findings and identify key trends in sunscreen usage among participating physicians. Descriptive statistics were used to present frequencies and percentages of responses.

A target sample size of 100 Indian physicians was selected to ensure the study's findings were based on a diverse and representative sample. This sample size was deemed adequate to support meaningful statistical analysis and draw reliable conclusions regarding sunscreen usage in dermatology among Indian healthcare providers.

Study results were compiled into a comprehensive report detailing key findings and implications for clinical practice. Findings were intended for dissemination through scientific publication in peer-reviewed journals and presentation at relevant medical conferences, subject to suitability and acceptance by respective venues.

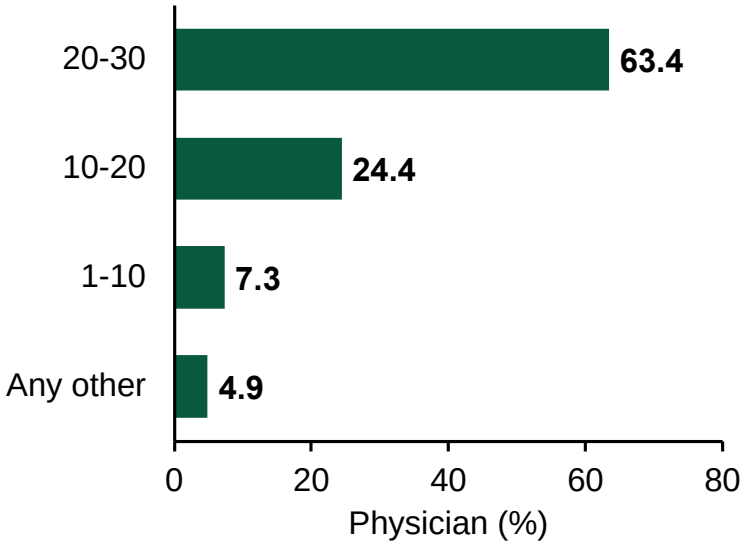
This study adhered to the ethical principles outlined in the Declaration of Helsinki. Ethical approval was sought from an Independent Ethics Committee. Participants were assured of their right to withdraw from the study at any time without any consequences. All responses were anonymized to ensure participant confidentiality.

5 RESULTS

A total of 82 HCPs participated in the survey. Below is the summary of the responses.

Question 1: In your routine practice, in a month, how many patients do you advice on using a sunscreen?

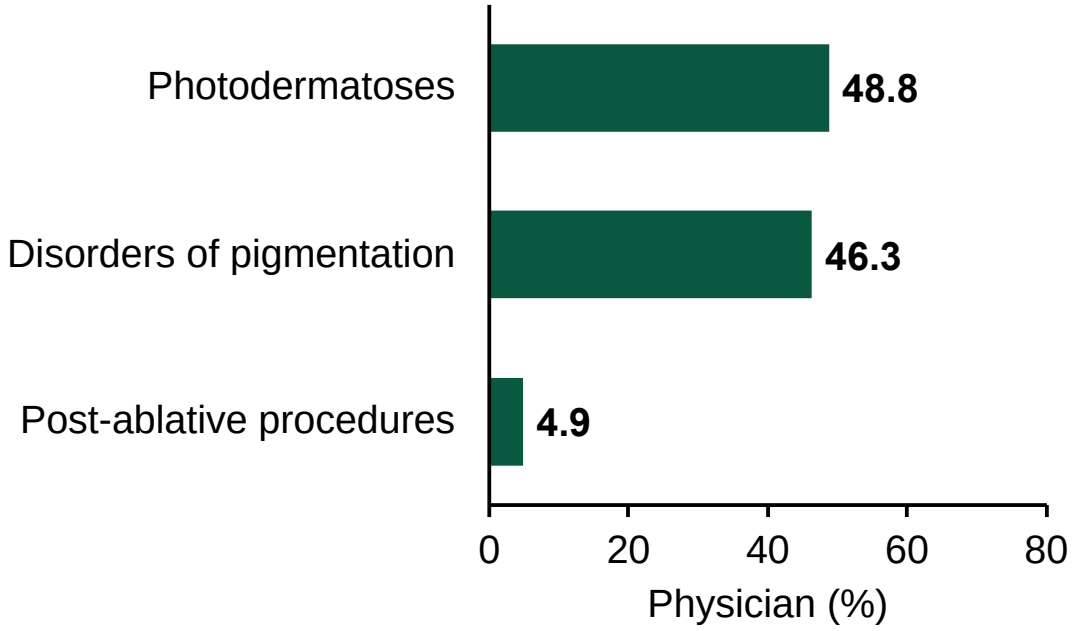
Options	Number of Physicians (N=82)
1-10	6 (7.3)
10-20	20 (24.4)
20-30	52 (63.4)
Any other	4 (4.9)
Data presented as n (%)	



- A small proportion of physicians (7.3%), reported advising 1-10 patients on sunscreen usage monthly.
- A notable 24.4% of physicians indicated that they advised between 10-20 patients on sunscreen usage in their routine practice.
- The majority of physicians, comprising 63.4%, advised 20-30 patients per month on the use of sunscreen, highlighting a significant focus on sun protection in their practice.
- A minority of 4.9% of physicians advised on sunscreen usage for a different number of patients outside the specified ranges.

Question 2: Which specific skin conditions do you most commonly recommend sunscreen for in your patients?

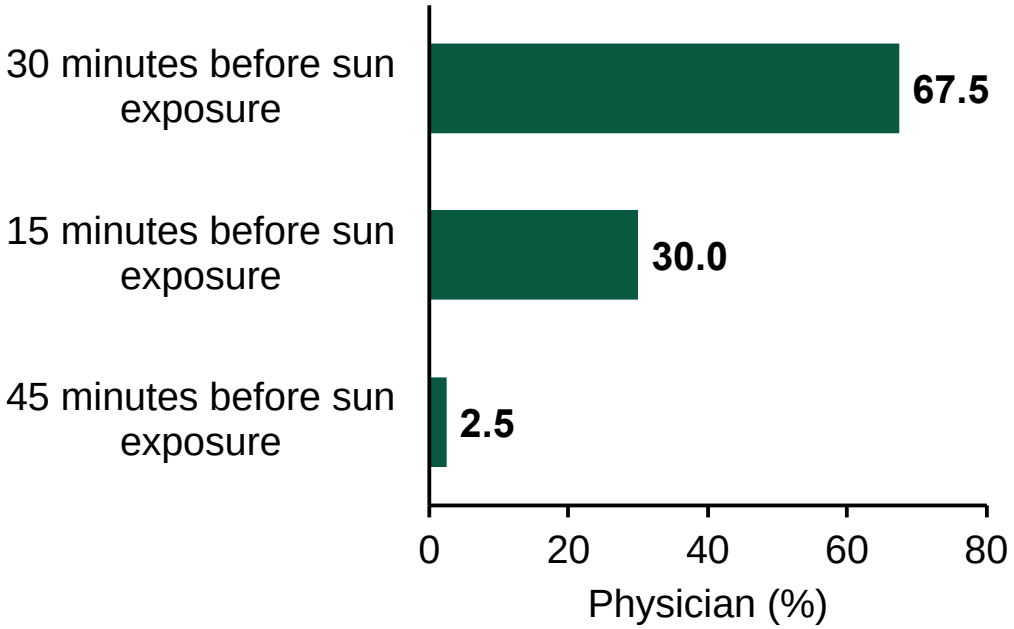
Options	Number of Physicians (N=82)
Photodermatoses	40 (48.8)
Disorders of pigmentation	38 (46.3)
Post-ablative procedures	4 (4.9)
Data Presented as n (%).	



- The majority of physicians (48.8%) most commonly recommended sunscreen for patients with photodermatoses.
- A significant portion of physicians (46.3%) recommended sunscreen for disorders of pigmentation.
- A small group of physicians (4.9%) recommended sunscreen primarily for post-ablative procedures.

Question 3: When should a sunscreen be applied before going out in the sun?

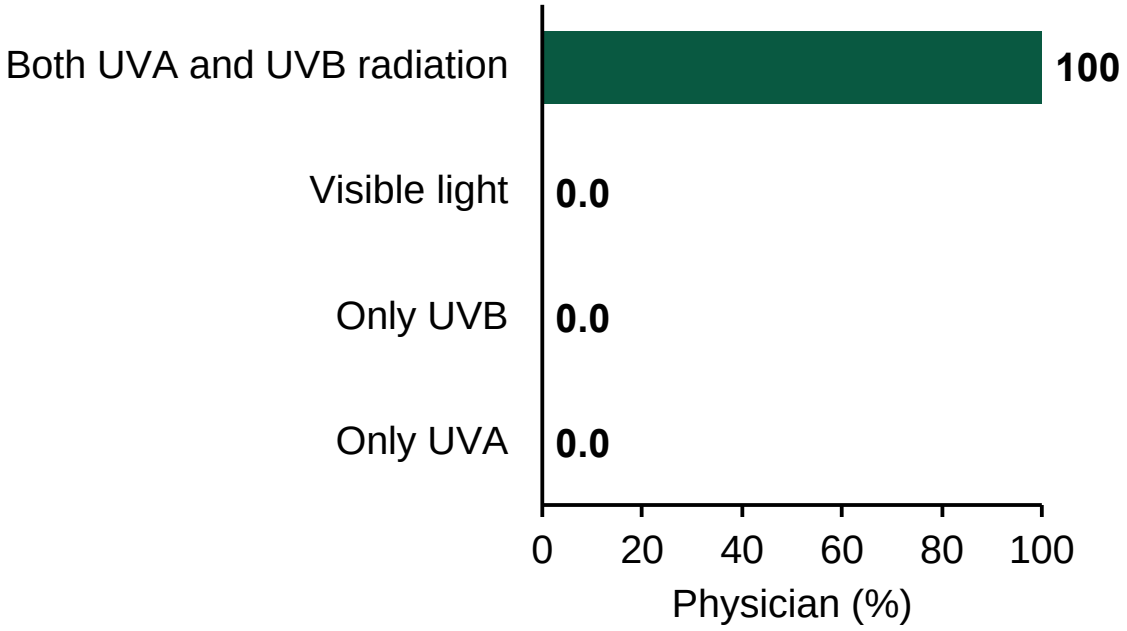
Options	Number of Physicians (N=80)
15 minutes before sun exposure	24 (30)
30 minutes before sun exposure	54 (67.5)
45 minutes before sun exposure	2 (2.5)
Data Presented as n (%).	



- The majority of physicians (67.5%) recommended applying sunscreen 30 minutes before sun exposure.
- A significant portion of physicians (30%) suggested applying sunscreen 15 minutes prior to sun exposure.
- A small fraction of physicians (2.5%) advised applying sunscreen 45 minutes before sun exposure.

Question 4: Which type of radiation filter should a sunscreen offer in your patients?

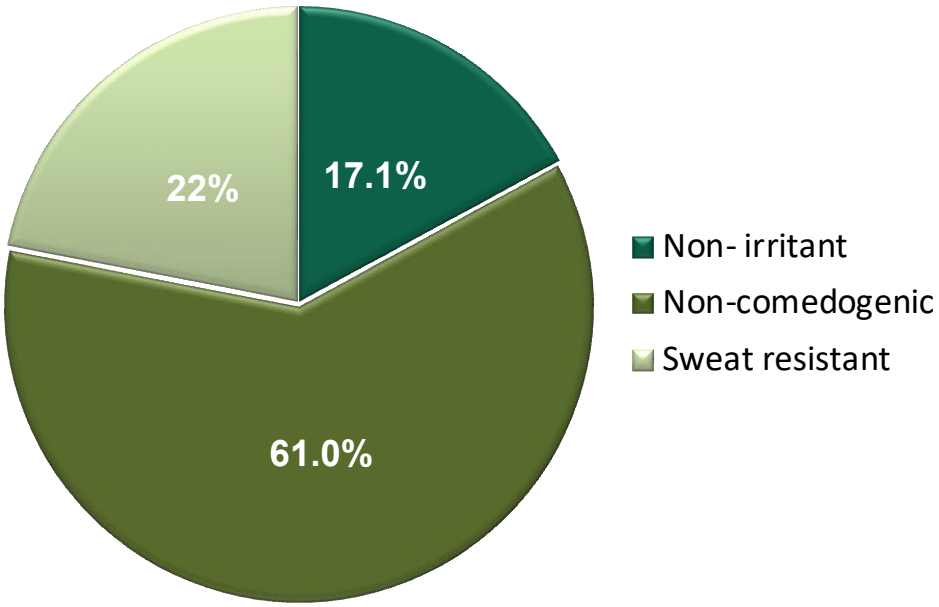
Options	Number of Physicians (N=82)
Only UVA	0 (0)
Only UVB	0 (0)
Both UVA and UVB radiation	82 (100)
Visible light	0 (0)
Data Presented as n (%).	



- All physicians (100%) unanimously recommended that sunscreens should offer protection against both UVA and UVB radiation.
- None of the physicians (0%) recommended sunscreens that filter only UVA radiation, only UVB radiation, or visible light.

Question 5: Which characteristics are desired in a sunscreen according to your expert opinion?

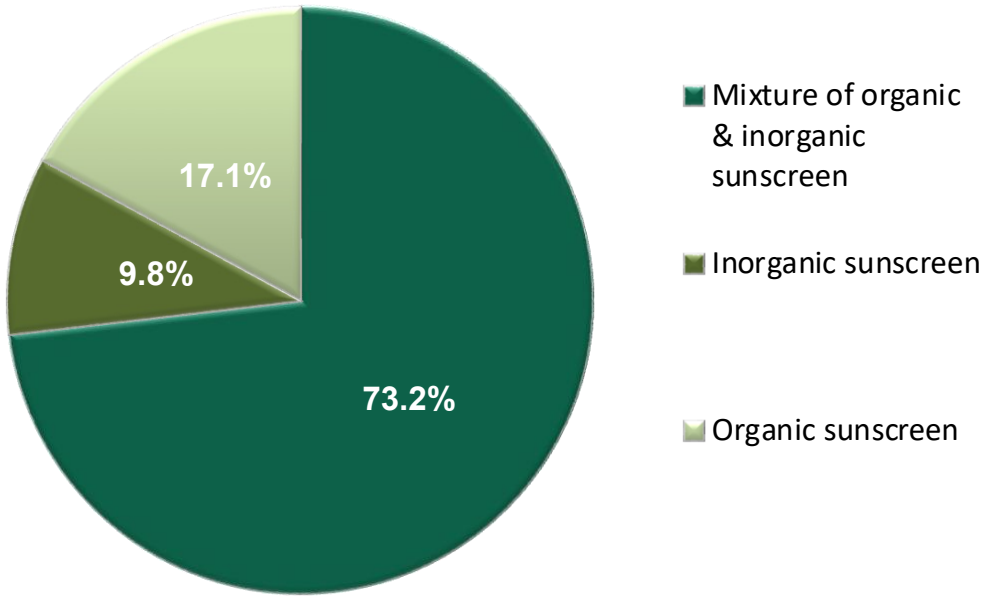
Options	Number of Physicians (N=82)
Non- irritant	14 (17.1)
Non-comedogenic	50 (61.0)
Sweat resistant	18 (22.0)
Data Presented as n (%).	



- The majority of physicians (61.0%) indicated that non-comedogenic properties were desired in a sunscreen.
- Approximately 17.1% of physicians preferred sunscreens that were non-irritant.
- A significant proportion of physicians (22.0%) desired sunscreens that were sweat resistant.

Question 6: Which type of sunscreen do you recommend in your patients?

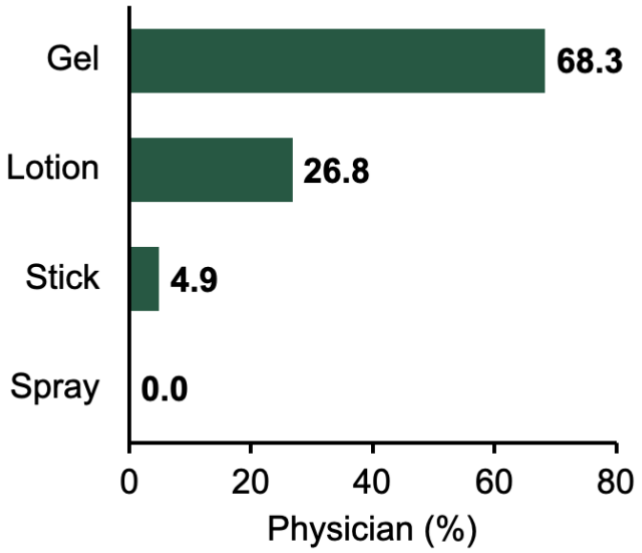
Options	Number of Physicians (N=82)
Mixture of organic & inorganic sunscreen	60 (73.2)
Inorganic sunscreen	8 (9.8)
Organic sunscreen	14 (17.1)
Data Presented as n (%).	



- The majority of physicians (73.2%) recommended a mixture of organic and inorganic sunscreens for their patients.
- A smaller proportion of physicians (9.8%) suggested using inorganic sunscreens exclusively for their patients.
- Some physicians (17.1%) recommended using organic sunscreens for their patients.

Question 7: Which formulation of sunscreen do you prefer in your routine practice?

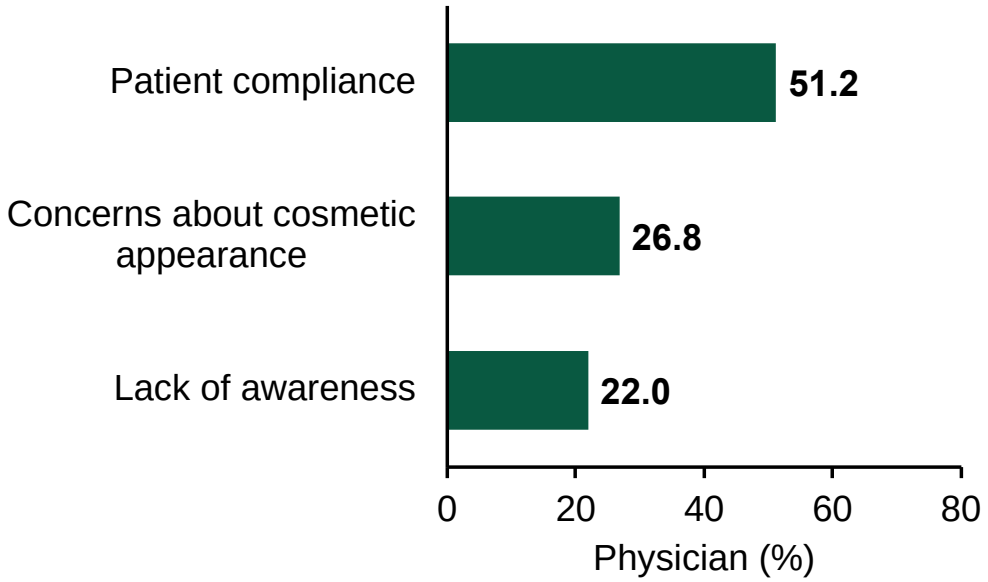
Options	Number of Physicians (N=82)
Lotion	22 (26.8)
Spray	0 (0)
Stick	4 (4.9)
Gel	56 (68.3)
Data Presented as n (%).	



- The majority of physicians (68.3%) preferred using sunscreen in gel formulation in their routine clinical practice.
- A notable proportion of physicians (26.8%) preferred sunscreen in lotion formulation.
- A small percentage of physicians (4.9%) preferred the stick formulation of sunscreen.
- No physicians (0%) recommended sunscreen in spray formulation.

Question 8: What challenges, if any, do you encounter when advising patients about sunscreen usage?

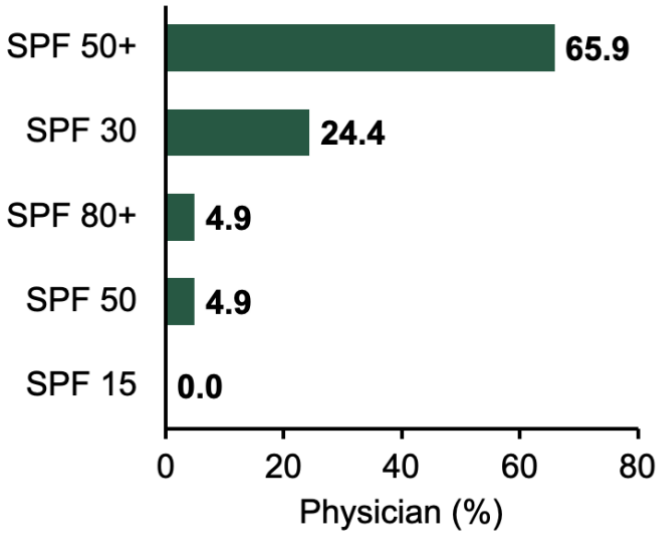
Options	Number of Physicians (N=82)
Patient compliance	42 (51.2)
Lack of awareness	18 (22.0)
Concerns about cosmetic appearance	22 (26.8)
Data Presented as n (%).	



- The most frequently reported issue was patient compliance, with 51.2% of physicians identifying difficulties in ensuring that patients consistently use sunscreen as recommended.
- A significant number of physicians (26.8%) encountered challenges related to patients' concerns about the cosmetic appearance of sunscreens, which affected their willingness to use them.
- Another challenge noted by some physicians (22.0%) was a lack of awareness among patients regarding the importance of sunscreen and its proper usage.

Question 9: What SPF (Sun Protection Factor) sunscreen do you typically recommend for your patients?

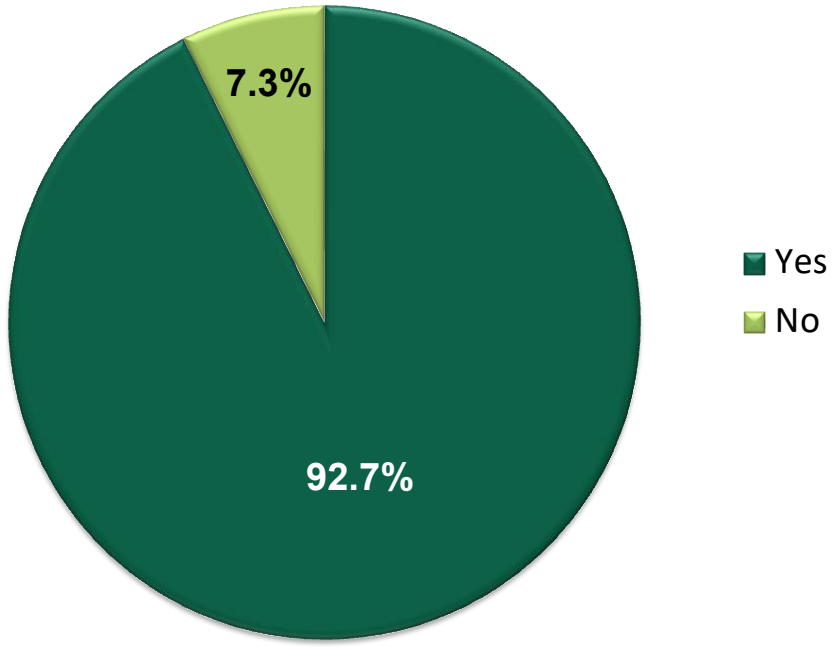
Options	Number of Physicians (N=82)
SPF 15	0 (0)
SPF 30	20 (24.4)
SPF 50	4 (4.9)
SPF 50+	54 (65.9)
SPF 80+	4 (4.9)
Data Presented as n (%).	



- The SPF (Sun Protection Factor) recommended by physicians for their patients was assessed among 82 participants.
- None of the physicians (0%) recommended sunscreen with SPF 15.
- A portion of physicians (24.4%) typically recommended sunscreen with SPF 30.
- A small percentage of physicians (4.9%) recommended SPF 50 sunscreen to their patients.
- The majority of physicians (65.9%) preferred recommending sunscreen with SPF 50+ in routine clinical practice.
- Additionally, 4.9% of physicians recommended sunscreen with SPF 80+.

Question 10: Will the property of blocking Blue light in a sunscreen be beneficial in your patients?

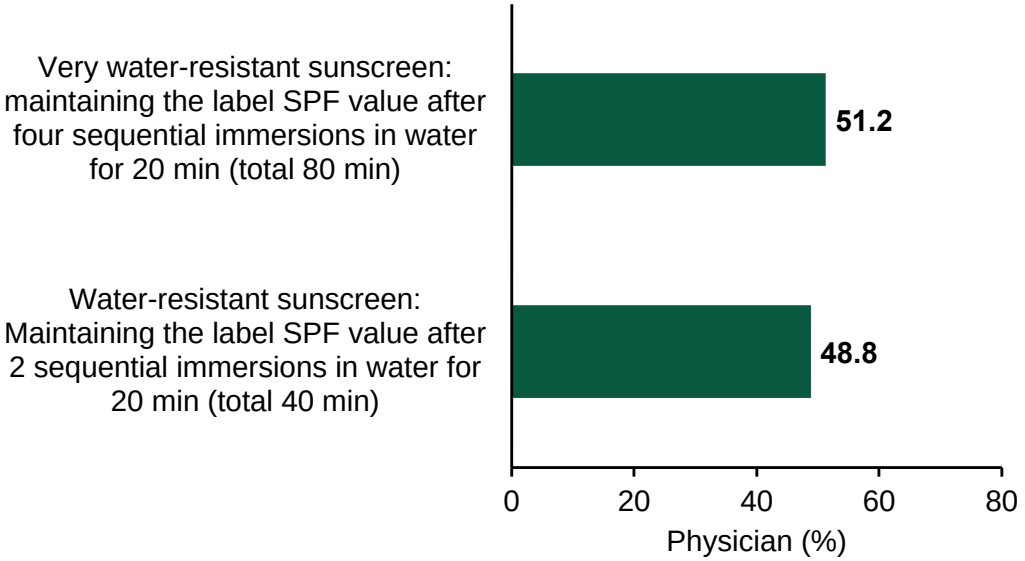
Options	Number of Physicians (N=82)
Yes	76 (92.7)
No	6 (7.3)
Data Presented as n (%).	



- The potential benefit of blocking blue light in sunscreen was evaluated among 82 physicians.
- A substantial majority of physicians (92.7%) believed that the property of blocking blue light in sunscreen would be beneficial for their patients.
- A smaller proportion of physicians (7.3%) did not consider the property of blocking blue light to be beneficial for their patients.

Question 11: Which type of water-resistant sunscreen do you prefer in your patients?

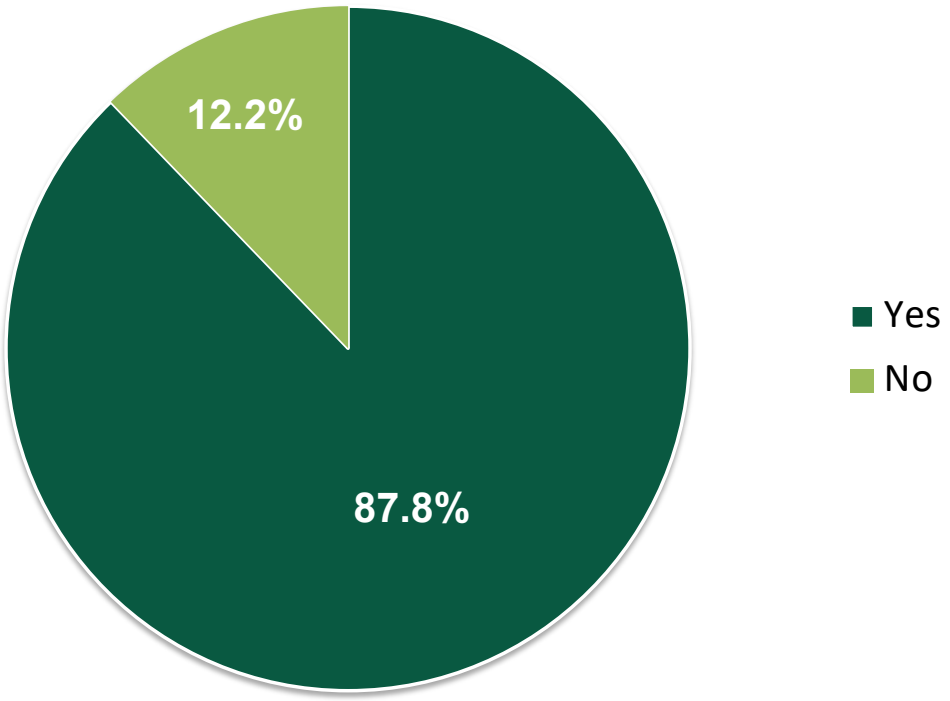
Options	Number of Physicians (N=82)
Water-resistant sunscreen: Maintaining the label SPF value after 2 sequential immersions in water for 20 min (total 40 min)	40 (48.8)
Very water-resistant sunscreen: maintaining the label SPF value after four sequential immersions in water for 20 min (total 80 min)	42 (51.2)
Data Presented as n (%).	



- Nearly half of the physicians (48.8%) preferred sunscreens that maintain their label SPF value after 2 sequential immersions in water for a total of 40 minutes.
- A slightly larger proportion of physicians (51.2%) favored sunscreens classified as very water-resistant, which maintain their label SPF value after 4 sequential immersions in water for a total of 80 minutes.

Question 12: In your routine clinical practice, do you recommend sunscreen for person working indoors?

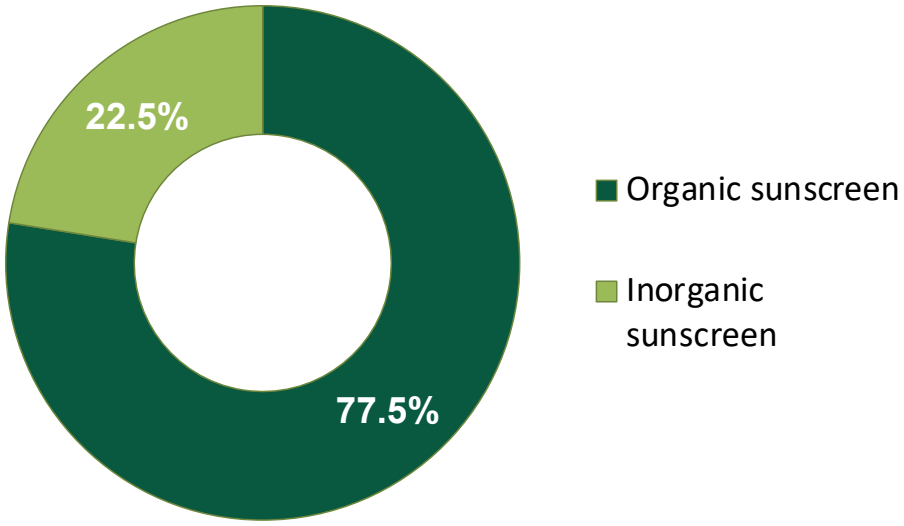
Options	Number of Physicians (N=82)
Yes	72 (87.8)
No	10 (12.2)
Data Presented as n (%).	



- In routine clinical practice, a substantial majority of physicians (87.8%) recommended sunscreen for persons working indoors.
- A smaller proportion of physicians (12.2%) did not recommend sunscreen for individuals working indoors.

Question 13: Which type of sunscreen you will prefer in patients with acne?

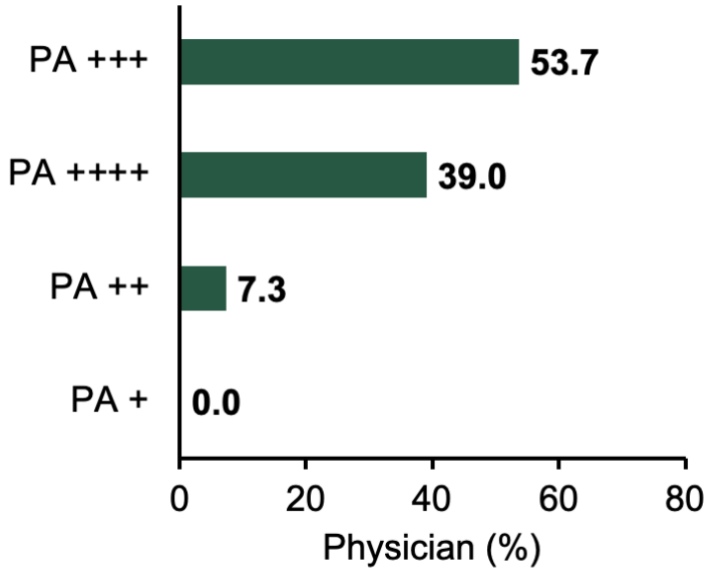
Options	Number of Physicians (N=80)
Organic sunscreen	62 (77.5)
Inorganic sunscreen	18 (22.5)
Data Presented as n (%).	



- The preferred type of sunscreen for patients with acne was assessed among 80 physicians.
- A majority of physicians (77.5%) preferred organic sunscreen for patients with acne.
- A smaller proportion of physicians (22.5%) preferred inorganic sunscreen for patients with acne.

Question 14: Which level of PA (Protection Grade of UVA) rating you prefer in a sunscreen?

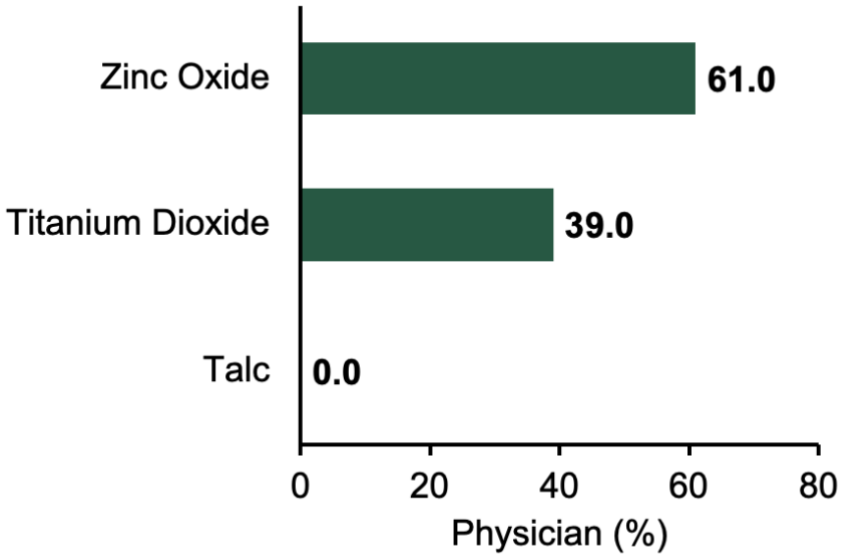
Options	Number of Physicians (N=82)
PA+	0 (0)
PA++	6 (7.3)
PA+++	44 (53.7)
PA++++	32 (39.0)
Data Presented as n (%).	



- The preferred level of PA (Protection Grade of UVA) rating in sunscreen was assessed among 82 physicians.
- A substantial majority of physicians (39.0%) preferred sunscreens with a PA++++ rating.
- The next largest group of physicians (53.7%) preferred sunscreens with a PA+++ rating.
- A small proportion of physicians (7.3%) preferred sunscreens with a PA++ rating.
- None of the physicians (0%) preferred sunscreens with a PA+ rating.

Question 15: Which inorganic sunscreen ingredient do you prefer in a sunscreen formulation?

Options	Number of Physicians (N=82)
Zinc Oxide	50 (61.0)
Titanium Dioxide	32 (39.0)
Talc	0 (0)
Data Presented as n (%).	



- The preferred inorganic sunscreen ingredient in sunscreen formulations was assessed among 82 physicians.
- A majority of physicians (61.0%) preferred sunscreen formulations containing zinc oxide.
- A smaller proportion of physicians (39.0%) preferred sunscreens with titanium dioxide.
- None of the physicians (0%) preferred talc as an ingredient in sunscreen formulations.

6 SUMMARY

The survey revealed that, 7.3% of physicians advised 1-10 patients monthly on sunscreen use, 24.4% advised 10-20 patients, and 63.4% advised 20-30 patients. Sunscreen was most commonly recommended for photodermatoses (48.8%) and disorders of pigmentation (46.3%), with fewer recommendations for post-ablative procedures (4.9%). Most physicians (67.5%) suggested applying sunscreen 30 minutes before sun exposure, 30% recommended 15 minutes prior, and 2.5% advised 45 minutes before exposure. All physicians (100%) agreed that sunscreens should protect against both UVA and UVB radiation.

For sunscreen properties, 61.0% preferred non-comedogenic formulas, 17.1% sought non-irritant options, and 22.0% desired sweat-resistant sunscreens. Most physicians (73.2%) favored a mix of organic and inorganic sunscreens, with 9.8% preferring inorganic-only and 17.1% preferring organic sunscreens. The preferred formulations were gels (68.3%), lotions (26.8%), and sticks (4.9%), with no preference for sprays. Compliance issues were the main concern (51.2%), followed by cosmetic appearance (26.8%) and lack of awareness (22.0%).

Regarding SPF, 24.4% of physicians recommended SPF 30, 4.9% preferred SPF 50, and the majority (65.9%) favored SPF 50+. Blue light protection was considered beneficial by 92.7% of physicians. For water resistance, 48.8% preferred sunscreens maintaining SPF after 40 minutes, and 51.2% preferred those maintaining SPF after 80 minutes. Sunscreen use was recommended for indoor workers by 87.8% of physicians. For acne patients, 77.5% preferred organic sunscreens. In terms of PA ratings, 39.0% preferred PA++++, 53.7% preferred PA+++, and 7.3% preferred PA++. Zinc oxide was favored by 61.0%, while 39.0% preferred titanium dioxide, with no preference for talc.

7 DISCUSSION

The survey revealed significant insights into dermatological sunscreen practices among physicians. Most physicians advised a substantial number of patients (20-30) on sunscreen use each month, emphasizing the importance of sun protection in dermatological care. The predominant recommendation for photodermatoses and disorders of pigmentation underscores the targeted approach to sunscreen usage for specific skin conditions, reflecting an understanding of the diverse needs of patients.

The preference for applying sunscreen 30 minutes before sun exposure aligns with established guidelines, suggesting a well-informed approach among physicians. The unanimous agreement on the need for sunscreens to provide protection against both UVA and UVB radiation indicates a high standard of care in ensuring comprehensive sun protection. The focus on non-comedogenic and sweat-resistant formulations highlights a concern for both efficacy and patient comfort.

The diverse preferences for sunscreen formulations—gel, lotion, and stick—demonstrate the need for tailored recommendations based on individual patient needs and preferences. Compliance challenges, particularly related to the cosmetic appearance of sunscreens, suggest a potential area for improvement in patient education and product development. The strong endorsement for SPF 50+ and the consideration of blue light protection reflect an advanced understanding of sun protection’s evolving role.

Overall, the survey underscores a high level of adherence to best practices and emerging trends in sunscreen recommendations among physicians. However, addressing patient compliance and expanding awareness about the benefits of sunscreen could further enhance the effectiveness of sun protection strategies. Future research could explore these aspects to improve patient outcomes and refine sunscreen recommendations.

8 CLINICAL RECOMMENDATIONS

- Advise patients to apply sunscreen 30 minutes before sun exposure for optimal protection.
- Recommend sunscreens offering broad-spectrum protection against both UVA and UVB radiation.
- Encourage the use of non-comedogenic and sweat-resistant sunscreens to enhance patient comfort and adherence.
- For patients with photodermatoses and disorders of pigmentation, stress the importance of consistent sunscreen use.
- Advocate for sunscreens with SPF 50+ to ensure high levels of protection, especially for patients at higher risk of sun damage.
- Consider the benefits of sunscreens that block blue light, particularly for patients concerned about digital exposure.
- Promote the use of a combination of organic and inorganic sunscreens to cater to diverse patient needs.
- For patients with acne, recommend organic sunscreens to minimize the risk of exacerbating their condition.
- Advise patients working indoors to use sunscreen to protect against incidental sun exposure.
- Emphasize patient education on the proper application and reapplication of sunscreen to improve compliance and effectiveness.

9 CONSULTANT OPINION

Further research is necessary to substantiate the findings of this study on sunscreen usage among physicians. Randomized controlled trials should be conducted to compare the efficacy and safety of different sunscreen formulations, including those with varying SPF levels and additional features like blue light protection. Long-term studies are needed to assess the impact of regular sunscreen use on skin health outcomes, such as the prevention of photodermatoses, disorders of pigmentation, and post-ablative procedure complications.

Subgroup analyses could identify specific patient populations that benefit most from particular sunscreen formulations, such as those with acne, different skin types, or varying degrees of sun exposure. Additionally, collecting real-world evidence would provide valuable insights into the effectiveness and patient adherence to sunscreen recommendations in diverse clinical settings.

Patient-reported outcomes should be explored to better understand the impact of sunscreen use on quality of life, treatment satisfaction, and adherence. Addressing these areas can guide more personalized and effective sunscreen recommendations, ultimately enhancing patient care and skin health management.

10 MARKET OPPORTUNITIES

The findings from this survey highlight significant market opportunities for sunscreen products tailored to the preferences and needs of Indian physicians and their patients. With a majority of physicians (63.4%) advising sunscreen use to 20-30 patients per month, there is a clear demand for effective sun protection solutions. This demand is further underscored by the fact that 48.8% of physicians commonly recommend sunscreens for photodermatoses, while 46.3% recommend them for disorders of pigmentation.

Given the strong preference for sunscreens with broad-spectrum protection against UVA and UVB radiation (100% of physicians) and additional features such as non-comedogenic properties (61.0%), there is substantial potential for developing and marketing sunscreens that meet these specific criteria. Furthermore, the high interest in sunscreens that block blue light (92.7%) and those that maintain their SPF value after water exposure (51.2%) presents a niche market for innovative formulations.

The preference for organic and inorganic sunscreen mixtures (73.2%) and gel formulations (68.3%) indicates an opportunity to cater to these specific product preferences. Additionally, addressing common challenges such as patient compliance and cosmetic concerns can enhance market penetration. By focusing on these aspects, companies can position their sunscreen products as essential, user-friendly solutions for comprehensive sun protection, thereby expanding their market presence in the dermatology sector.

11 MARKET POSITIONING

Essential Dermatological Protection

Position sunscreen as an essential component of dermatological protection, emphasizing its necessity in managing various skin conditions such as photodermatoses and disorders of pigmentation. Highlight the widespread endorsement by physicians (48.8% for photodermatoses and 46.3% for pigmentation disorders), showcasing the clinical advantages and trusted recommendations.

Tailored for Diverse Needs

Market sunscreen products as ideal solutions for diverse patient needs, particularly those requiring broad-spectrum protection against UVA and UVB radiation (100% physician recommendation). Emphasize the benefits of formulations with non-comedogenic properties, blue light blocking (92.7% physician preference), and water-resistant features (51.2%), catering to both aesthetic and functional requirements.

Endorsed by Experts

Leverage the high preference and endorsement by dermatologists to build credibility and trust. Highlight the physician-driven demand for advanced sunscreen formulations, including the preference for a mixture of organic and inorganic ingredients (73.2%) and gel-based formulations (68.3%). Use these endorsements to reassure patients and healthcare providers of the effectiveness, safety, and innovation behind the sunscreen products.

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